ABSTRACT OF THE DISCLOSURE

Electrode active materials comprising lithium or other alkali metals, a transition metal, a phosphate or similar moiety, and a halogen or hydroxyl moiety. Such electrode actives include those of the formula:

$A_aM_b(XY_4)_cZ_d$,

wherein

- (a) A is selected from the group consisting of Li, Na, K, and mixtures thereof, and $0 < a \le 6$;
- (b) M comprises one or more metals, comprising at least one metal which is capable of undergoing oxidation to a higher valence state, and $1 \le b \le 3$;
- (c) XY₄ is selected from the group consisting of X'O_{4-x}Y'_x, X'O_{4-y}Y'_{2y}, X"S₄, and mixtures thereof, where X' is P, As, Sb, Si, Ge, S, and mixtures thereof; X" is P, As, Sb, Si, Ge and mixtures thereof; Y' is halogen; $0 \le x < 3$; and 0 < y < 4; and $0 < c \le 3$;
- (d) Z is OH, halogen, or mixtures thereof, and $0 < d \le 6$; and wherein M, X, Y, Z, a, b, c, d, x and y are selected so as to maintain electroneutrality of said compound.

In a preferred embodiment, M comprises two or more transition metals from Groups 4 to 11 of the Periodic Table. In another preferred embodiment, M comprises M'M", where M' is at least one transition metal from Groups 4 to 11 of the Periodic Table; and M" is at least one element

from Groups 2, 3, 12, 13, or 14 of the Periodic Table. Preferred embodiments include those having where c=1, those where c=2, and those where c=3. Preferred embodiments include those where $a \le 1$ and c=1, those where a=2 and c=1, and those where $a \ge 3$ and c=3. This invention also provides electrodes comprising an electrode active material of this invention, and batteries that comprise a first electrode having an electrode active material of this invention; a second electrode having a compatible active material; and an electrolyte.